

## **ABSTRACT**

### **METHOD FOR FORMING A RUTHENIUM METAL LAYER**

A method for forming a ruthenium metal layer comprises combining a ruthenium precursor with a measured amount of oxygen to form a ruthenium oxide layer. The  
5 ruthenium oxide is annealed in the presence of a hydrogen-rich gas to react the oxygen in the ruthenium oxide with hydrogen, which results in a ruthenium metal layer. By varying the oxygen flow rate during the formation of ruthenium oxide, a ruthenium metal layer having various degrees of smooth and rough textures can be formed.